University of Information Technology &Sciences (UITS)

Faculty of Science and Engineering

Department of Computer Science and Engineering

Program: B.Sc. in CSE

Term Final Question, Autumn-2023

Course Title: Fundamentals of Electrical Engineering

Course Code: EEE 151

Marks: 50 **Time: 3*(three)* hours**

(Answer all questions)

Q. No.		Marks
1.	a) For the circuit of figure 1, find R_L for maximum power delivered to R_L and determine that maximum power.	[05]

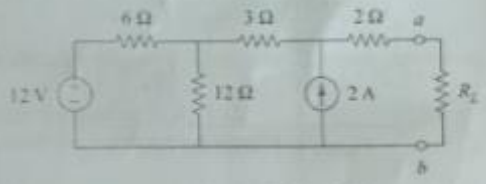

Figure 1: Circuit for 1 (a)

b) Find the voltages at the three nonreference nodes in the circuit of figure 2. [05]

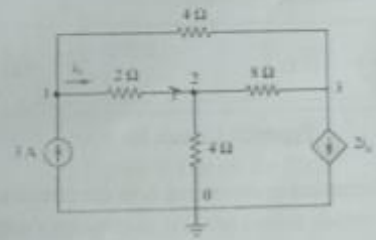

Figure 2: Circuit for 1(b)

2. (a) For the circuit in figure 3, determine v and i. [05]

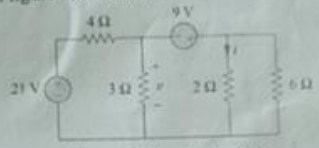

Figure 3: Circuit for 2(a)

(b) Solve for the mesh currents in figure 4. [05]

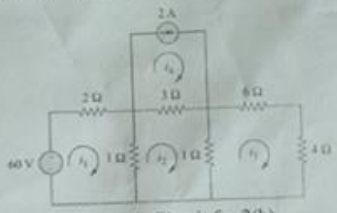

Figure 4: Circuit for 2(b)

3. (a) Determine v_o in the circuit of figure 5, using the superposition principle. [05]

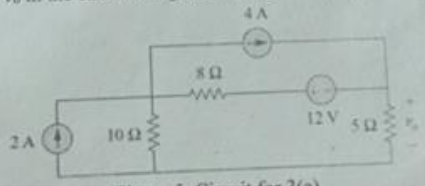

Figure 5: Circuit for 3(a)

(b) Use source transformation to determine i_o in the circuit of figure 6. [05]

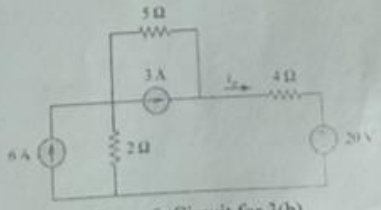

Figure 6: Circuit for 3(b)

4. (a) Using Thevenin's theorem, find the equivalent circuit to the left of the terminals a-b in the circuit of figure 7. And find I [05]

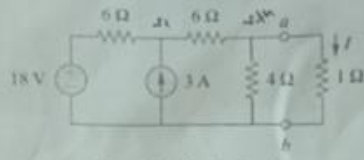

Figure 7: Circuit for 4(a)

(b) Find the Norton equivalent circuit of the circuit in figure 8, at terminals a-b. [05]

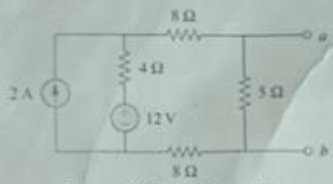

Figure 8: Circuit for 4(b)

5. (a) *i)* For the circuit of figure 9, obtain the Thevenin equivalent at terminals a-b. [06]
ii) Calculate the current in $R_L = 8\Omega$.
iii) Determine the maximum power.

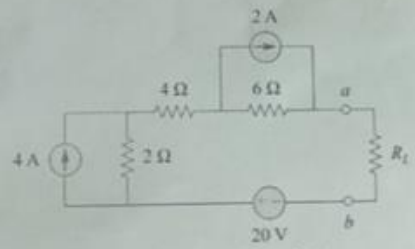

Figure 9: Circuit for 5(a)

(b) Determine the mesh currents i_1, i_2 in the circuit shown in figure 10. [04]

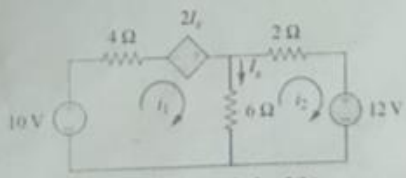

Figure 10: Circuit for 5(b)